

Appl. No.: 10/087,485
Amdt. Dated: July 14, 2003
Reply to Office Action of: October 13, 2003

Attorney Docket No. SP01-033A

Remarks

In view of the above amendments and the following remarks, favorable reconsideration of the outstanding office action is respectfully requested.

Claims 13, 15, 18-19, 27, 29-31, 33, and 41-43 remain in this application. Claims 13, 15, 19, 27, 30 and 33 have been amended. Claims -12, 14, 16-17, 20-26, 28, 32, 33-40, and 44-50 have been canceled. New claims 51 and 52 have been added. No Claims have previously been withdrawn from consideration.

1. Drawings

The Examiner has indicated in the accompanying form PTO-948 that the informal drawings previously submitted have not been approved. Formal drawing are enclosed for approval.

2. § 112 Rejections

The Examiner has rejected claims 1-49 under 35 U.S.C. § 112, second paragraph, as being indefinite, vague and confusing. Applicants' have attempted to clarify what is being claimed by reducing the number of claims to those that claim the invention without being redundant, and amending the claims, including by the addition of clarifying punctuation, to more clearly claim the invention. Applicants request that if the Examiner believes further clarification is useful, the Examiner call applicants' attorney on this matter.

4. § 102 Rejections

In the Office Action the Examiner has rejected original claims 1, 12, 15, 16, 27, 30, 31, 45-47 and 49 under 35 U.S.C. § 102(e) as being anticipated by Stamm, U.S. Patent No. 6,560,254 B2, and Rebhan U.S. Patent Application No. 2001/0043331. Of the foregoing claims rejected in the Office Action, only claims 15, 27, and 31 remain in the application. According, Applicants will comment only on the rejection relating to these claims.

- A. The Examiner cites Stamm as disclosing "an ArF or KrF excimer laser for producing a 193 nm discharge at a pulse rate of 4 kHz or more, with optical window absorption." Specifically, the Examiner cites the Abstract; Figures 3e, 4a-c and 5; and

Appl. No.: 10/087,485
Amdt. Dated: July 14, 2003
Reply to Office Action of: October 13, 2003

Attorney Docket No. SP01-033A

Column 2: 40-67, Column 5-6: 15-67; Column 8, Column 9, Column 11:15-40 and Column ??: 19-24. Applicant traverses the rejection.

Stamm recites the material parts of the laser described therein as having an absorbance of less than $10 \times 10^{-3}/\text{cm}$ at 193 incident radiation. In applicant's independent claims 15 and 30, applicants recite a 200-210 nm absorption coefficient of $<0.0017/\text{cm}$ ($1.7 \times 10^{-3}/\text{cm}$). This value is approximately an order of magnitude lower than the maximum value recited by Stamm.

Stamm is indefinite and does not describe the actual power or fluence of any laser mentioned therein. While Stamm uses the term "high power laser" this term is not describes. In contrast to Stamm the present indention, as claimed for example in independent Claim 13, describes a laser having fluence (energy density) of greater then $40 \text{ mJ}/\text{cm}^2$. In view of this fact applicants submit that Stamm does not teach the claimed invention.

Finally, impurity levels in the optical material affect the transmissive properties of the optical elements used in the laser. In contrast to the claimed invention, Stamm nowhere describes properties of the optical materials used, for example, in the laser chamber windows or prisms.

Therefore, in view of the above difference between Stamm and the claims invention, applicants submit that the claimed invention is patentable over U.S. Patent No. 6,560,254 B2 to Stamm.

B. The Examiner cites Rebhan as disclosing in Figure 1 "an ArF or KrF excimer laser, where chamber (60 has windows made of magnesium fluoride that is transmissive to UV wavelength as describes in the (ABSTRACT) and paragraphs [0006] [0017] 0024 [0034]." Applicants traverse the rejection.

Rebhan describes a fluorescence *method* for evaluating materials for use in as optical elements. *However, Rebhan does not describe what are acceptable or unacceptable materials except in the most general terms.* That is, Rebhan does not give specific properties of the materials deemed useful. For example, in paragraph [0039] Rebhan simply says "A high florescence intensity would indicate a high absorbance coefficient and low quality of the optical materials of the block [of material intended to be used for an optical element]." (Comment added.) No mention

Appl. No.: 10/087,485
Amdt. Dated: July 14, 2003
Reply to Office Action of: October 13, 2003

Attorney Docket No. SP01-033A

is made of durability with regard to fluence, number of pulses, etc. In contrast to Rebhan, applicants' specification and claims describe various properties of optical materials.

Therefore, in view of the foregoing facts, applicants respectfully submit that Rebhan does not anticipate the claimed invention.

5. § 103 Rejections

Of the amended claims remaining in the application, the Examiner has rejected claims 13, 18, 19, and 41-44 under 35 U.S.C. § 103 as being unpatentable for obviousness over Stamm ('254) and Rebhan ('331) cited in full above. In particular, the Examiner states that the combination discloses the invention except for the percentage of transmission wavelength; that it is within the general skill of one skilled in the art to select a material on the basis for its suitability for the design; and that it is inherently obvious that magnesium fluoride has an absorption coefficient and that discovering the optimum or workable range is routine. Applicant traverses the rejection.

Applicant submits that the combination of Stamm and Rebhan does not teach or suggest the claimed invention by combination of the arguments present above in the section relating to the §102(e) rejection. The combination not only does not teach the percentage of transmission, it does not teach the purity of materials necessary to allow high transmittance and durability, and it teach a material who absorbance is approximately an order of magnitude greater than applicants at approximate 193 nm. Further, Rebhan teaches a measuring method, but fails to teach specifications for an acceptable material.

Therefore, applicants respectfully submit that that claimed invention is patentable over the combination of cited art.

6. Art made of record and not relied on.

The following art was cite, but not relied on, as disclosing fluorine narrow band excimer [lasers] having repetition rate of 4 kHz and 193 nm wavelength.

A. U.S. 6,567,540 to Myer et al.

This Myer citation is directed to a two chamber laser unit and citation seem confusing and indefinite as to the pulse energies. Referring to column 3, lines 8-

Appl. No.: 10/087,485
Amdt. Dated: July 14, 2003
Reply to Office Action of: October 13, 2003

Attorney Docket No. SP01-033A

12, the pulse energies are in the range of 5-10 mJ. While Myer uses the word "greater" in conjunction with the foregoing fluence, applicant submits that Myer does not contemplate fluence of 40 mJ or more, a value 4-10 times that cited in the patent.

Therefore, applicants submit that Myer neither teaches nor suggests the claimed invention.

B. US 2002/0044586 to Meyer et al.

Applicants' review of this citation indicates that the specification is identical to that above. The same comments are applicable. No specification or durability characteristics of the optical elements in the laser are given. Applicants submit that this Myer citation neither teaches nor suggests the claimed invention.

C. U.S. 2002/0154671 to Knowles

This application is directed to a master oscillator, power amplifier (MOPA) system. As with the two foregoing citations (also assigned to Cymer), the pulse energies are in the range of 5-10 mJ. No specification or durability characteristics of the optical elements in the laser are given. Applicants submit that this Myer citation neither teaches nor suggests the claimed invention.

D. U.S. 2002/0105994 to Partlo et al.

This citation indicates in paragraph [0028] that the invention is directed to a 4kHz ArF laser with 5 mJ/pulse output and a 4kHz KrF laser with 10 mJ/pulse output. These values are lower than those claimed with relation to the windows/prisms of the present invention by a factor of 4-8. Consequently, applicants submit that this citation neither teaches nor suggests the claimed invention.

E. U.S. 6m3435065 to Kleinschmidt

This citation of an excimer laser mentions the use of a MgF_2 window in the laser, but is silent concerning the durability, impurity, and transmittance characteristic of the window in the laser system as is claimed in the present

Appl. No.: 10/087,485
Amdt. Dated: July 14, 2003
Reply to Office Action of: October 13, 2003

Attorney Docket No. SP01-033A

application. Consequently, applicants submit that this citation does not teach or suggest their claimed invention.

F. U.S. 2003/0122450 to Sparrow

This citation and the present application both claim priority to the same provisional application, US 60/272,814. Accordingly, U.S. 2003/0122450 is not prior art to the invention claimed in the present application. See paragraph [0002] of the present application. Robert Sparrow is one of the inventors of the present application. Accordingly, this citation is not proper against the present application and should be withdrawn.

G. U.S. 2002/0122451 to Sparrow

This citation, the citation in "F", and the present application are and at all time have been assigned to Corning Incorporated. Further, the Provisional Application to which the present application claims priority and the Provisional Application of US2002/012245 were simultaneously filed on the same day by Corning Incorporated. Therefore, applicants submit that US2002/012245 is not a reference relative to the present invention.

H. U.S. 6,421,365 to Kleinschmidt

This citation of an excimer laser mentions the use of a MgF_2 window in the laser, but is silent concerning the durability, impurity, and transmittance characteristic of the window in the laser system as is claimed in the present application. Consequently, applicants submit that this citation does not teach or suggest their claimed invention.

7. Conclusion

Based upon the above amendments, remarks, and papers of record, Applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests reconsideration of the pending claims 13, 15, 18-19, 27, 29-31, 33, and 41-43 and a prompt Notice of Allowance thereon.

Appl. No.: 10/087,485
Amdt. Dated: July 14, 2003
Reply to Office Action of: October 13, 2003

Attorney Docket No. SP01-033A

Applicant believes that no extension of time is necessary to make this Response timely. Should Applicant be in error, Applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Walter M. Douglas at 607-974-2431.

13 October 2003
Date

| |
|--|
| CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8 I hereby certify that this paper and any papers referred to herein are being transmitted by facsimile to the U.S. Patent and Trademark Office at 703-872-9318 on: <u>13 October 2003</u> Date <u>Walter M. Douglas</u> Walter M. Douglas Date <u>13 October 2003</u> |
|--|

Respectfully submitted,
CORNING INCORPORATED

Walter M. Douglas
Walter M. Douglas
Registration No. 34,510
Corning Incorporated
Patent Department
Mail Stop SP-TI-03-1
Corning, NY 14831

RECEIVED
CENTRAL FAX CENTER

OCT 14 2003

OFFICIAL